# *Highly Realistic, Immersive Training for Navy Corpsmen: Preliminary Results*


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# Highly Realistic, Immersive Training for Navy Corpsmen: Preliminary Results

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**ABSTRACT** Highly realistic, immersive training has been developed for Navy corpsmen based on the success of the Infantry Immersion Trainer. This new training is built around scenarios that are designed to depict real life, operational situations. Each scenario used in the training includes sights, sounds, smells, and distractions to simulate realistic and challenging combat situations. The primary objective of this study was to assess corpsmen participants' satisfaction with highly realistic training. The study sample consisted of 434 male Navy service members attending Field Medical Training Battalion West, Camp Pendleton, California. Corpsmen participants completed surveys after receiving the training. Participants expressed high levels of satisfaction with the training overall and with several specific elements of the training. The element of the training that the corpsmen rated the highest was the use of live actors. The vast majority of the participants reported that the training had increased their overall confidence about being successful corpsmen and had strengthened their confidence in their ability to provide care under pressure. Additional research should extend highly realistic training to other military medical provider populations.

## INTRODUCTION

Navy hospital corpsmen serve as medical specialists for the U.S. Navy and Marine Corps. Corpsmen provide a full spectrum of medical care, ranging from routine care to emergency treatment and stabilization of severely injured and dying service members. In operational settings, including combat, corpsmen are often the sole or the primary medical providers available to the Marines and sailors with whom they serve. Working in operational settings presents corpsmen with enormous challenges as they seek to provide quality medical care in situations that may be hostile, harsh, and nonsterile, and with limited equipment and supplies. In addition, Navy corpsmen who work in operational settings are a unique group because they are exposed to a double burden of stress: imminent threat to their personal safety and the responsibility of caring for ill and injured service members.

Highly realistic, immersive training has been developed for Navy corpsmen based on the success of the Infantry Immersion Trainer for Marines.[1,2] Highly realistic corpsmen training is built around scenarios that are carefully designed to depict real-life, operational situations. Each scenario used in the training includes sights, sounds, smells, and distractions to simulate realistic and challenging combat situations. The scenarios involve using live actors who depict casualties needing medical attention. Many of the actors who play the role of casualties are actual amputees, some of whom were injured in combat. The scenarios require that corpsmen demonstrate specific medical skills in a chaotic, stressful environment.

Highly realistic, immersive training is currently being delivered to corpsmen students attending Field Medical Training Battalion (FMTB) West, located at Camp Pendleton, California. There are two FMTB schools, FMTB West at Camp Pendleton and FMTB East at Camp Lejeune, North Carolina. Completion of training at either of the two FMTB schools provides corpsmen with the Navy Enlisted Classification of HM 8404 (Field Medical Service Technician). These "8404" corpsmen can be assigned to Marine Corps units and serve alongside Marines, whether deployed to a combat zone or on other operational deployments or nondeployed assignments. The 8404 corpsmen can also be assigned to Navy medical treatment facilities and Navy platforms.

The culmination of the corpsmen students' 8404 training at FMTB West involves a final exercise in which the student corpsmen must practice their medical and tactical (battlefield) skills under simulated combat conditions. Given evidence that corpsmen and other military medical providers (e.g., nurses and physicians) are at increased risk for mental health problems,[3–5] combined with observations and data regarding the success of the Infantry Immersion Trainer, it seemed likely that the application of such highly realistic training could be beneficial to Navy corpsmen who may be serving in combat zones and other operational settings.

The primary objective of this study was to assess the corpsmen students' satisfaction with the highly realistic, immersive training. We hypothesized that corpsmen would express a high level of satisfaction with the training. Data collection for this study is ongoing; preliminary results are presented in this report.

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## METHODS

### Description of the Training

This project provides highly realistic, immersive training to corpsmen students enrolled at the FMTB West School. This training takes place in a Military Operations in Urban Terrain (MOUT) town, a mock village located at Camp Pendleton. Actor, props, and special effects (such as explosions) are used to augment the MOUT town's existing infrastructure. The training is based on preplanned scenarios and involves actors who are trained to display appropriate symptoms according to their assigned medical condition (e.g., respiratory distress, shock, and blast wound) and to interact with corpsmen while receiving medical attention. Special effects are used to create realistic sights, sounds, and smells. The training is designed to test the students' Tactical Combat Casualty Care (TCCC) as well as their basic infantry skills. The students are given feedback from their instructors at the conclusion of the training, which is part of the corpsmen's final exercise for the FMTB course.

In the context of this project, highly realistic training involves using the following components: "6 in 1" mannequins on which the corpsmen practice TCCC procedures, including the intraosseous infusion system, insertion of a nasal tube, cricothyroidotomy, and needle thoracentesis; professional actors who play the role of patients with specific medical problems (e.g., uncontrolled bleeding and respiratory distress); combat conditions generated through the use of special effects, such as explosions and sirens; and scenarios that are designed to depict real-life, operational situations. In each scenario, corpsmen must react to a number of mock casualties portrayed by professional actors. Two groups of victims particularly challenge the corpsmen. Some actors wear a device called a "cut suit," which is a false torso that fits over the actor's real torso, whereas the other actors enact the loss of limbs. The inclusion of these two types of casualties permits the attending corpsman to practice medical skills such as hemorrhagic control and needle thoracentesis to relieve respiratory trauma.

During the final exercise, each student participates in two different training scenarios with other members of their squad (approximately 15 22 students). At the beginning of each scenario, students are assigned to specific roles, including primary medical caregiver (corpsman), fire team, litter bearer, security, and squad leader. After each training scenario, which lasts approximately 30 minutes, instructors give a debriefing during which they provide feedback on students' mastery of TCCC and infantry skills.

### Subjects

The sample consisted of 434 male Navy service members who were corpsmen enrolled in FMTB West (FMTB West trains only male corpsmen; both male and female corpsmen are trained at FMTB East.). Age of study participants ranged from 18 to 37 (mean of 21.8 years). Tenure in the Navy ranged from 6 months to 19 years (mean of 1.6 years). All participants were enlisted (i.e., no officers). Pay grades ranged from E-1 to E-5; the majority of the participants were in pay grades E-2 (26%) or E-3 (42%). Most of the participants were single (never married; 80%), 17% of the sample were currently married, and 3% were divorced or separated. The participants were predominantly non-Hispanic white (52%), with smaller proportions of Asian (9%), black (9%), Hispanic (5%), and other race groups. A quarter of respondents (25%) marked "mixed or multiple races."

### Measures

To evaluate satisfaction with the training, the student corpsmen participants were asked to complete post-training surveys that were administered within a few days after participation in the highly realistic training. The post-training survey contained a number of different questions that assessed satisfaction with the training. Participants were asked to rate the training overall, as well as specific elements of the training, such as the use of role players/actors, the special effects, and the sense of realism.

One section of the post-training survey asked participants to indicate their perceptions of the benefits of the training on a variety of factors, including their overall confidence in being successful corpsmen, their ability to provide care under pressure, and their infantry skills. The survey included a variety of other questions about the training, including an assessment of how much participants enjoyed the training and how satisfied they were with their own performance. All of the closed-ended survey items were rated using 5-point response scales. In addition to the closed-ended questions, the post-training survey contained the following open-ended questions: "What did you like the most about the training?" and "What did you like the least about the training?"

All research procedures were approved by the Naval Health Research Center's Institutional Review Board.

## RESULTS

Participants' ratings of the training are presented in Table I. The response scale for this set of items ranged from 1 (poor) to 5 (excellent). As the table shows, satisfaction with the training overall was high, with a mean rating of 4.11 on a 5-point scale. This indicates an average rating that falls between "good" and "excellent." The majority of the participants gave the training a global rating of either "excellent" (40.5%) or "good" (35.6%). Mean ratings of specific elements of the training were also fairly high, ranging from a high of 4.37 for the "use of role players/actors" to a low of 3.94 for "sense of realism." The majority of the participants rated each specific element of the training as either "excellent" or "good" (Table I).

One set of items on the survey asked respondents to assess perceived benefits of the training. Respondents rated five different factors: (1) their overall confidence about being a

**TABLE I.** Participants' Ratings of the Training[a]

| Rated Item | Poor/Fair[b] | Satisfactory | Good | Excellent | Mean Rating |
|---|---|---|---|---|---|
| Training Overall | 4.2% | 19.8% | 35.6% | 40.5% | 4.11 |
| Use of Role Players/Actors | 3.3% | 12.2% | 28.6% | 56.0% | 4.37 |
| Mock Battle Setting | 8.7% | 16.9% | 33.6% | 40.8% | 4.05 |
| Combat Action Scenarios | 9.1% | 17.1% | 34.1% | 39.7% | 4.02 |
| Special Effects | 8.0% | 16.2% | 32.4% | 43.4% | 4.08 |
| Sense of Realism | 9.5% | 20.0% | 34.4% | 36.2% | 3.94 |

[a]Participants were asked "Please rate how much you liked the training and specific parts of the training." [b]Responses of "poor" and "fair" were combined.

**TABLE II.** Participants' Perceptions of Training Benefits[a]

| Survey Item | Not At All/Somewhat[b] | Moderately | Very | Extremely | Mean Rating |
|---|---|---|---|---|---|
| Your Overall Confidence About Being a Successful Corpsman | 8.8% | 18.2% | 40.1% | 32.9% | 3.93 |
| Your General Corpsman Medical Skills | 17.5% | 19.9% | 36.5% | 26.1% | 3.61 |
| Your Infantry Skills | 13.2% | 25.2% | 38.1% | 23.6% | 3.68 |
| Your Ability to Perform in an Operational Environment | 7.1% | 20.5% | 44.5% | 27.9% | 3.91 |
| Your Ability to Provide Medical Care Under Pressure | 15.1% | 16.0% | 38.7% | 30.2% | 3.75 |

[a]Participants were asked "To what degree did the training benefit. . . ?" [b]Responses of "not at all" and "somewhat" were combined.

successful corpsman, (2) their general corpsman medical skills, (3) their infantry skills, (4) their ability to perform in an operational environment, and (5) their ability to provide medical care under pressure. The response scale for this set of items ranged from 1 (not at all) to 5 (extremely). These results are shown in Table II. For all five of these items, the majority of the respondents stated that the training had benefited them either "extremely" or "very." Mean ratings of the benefits of the training were fairly high, ranging from 3.93 for overall confidence about being a successful corpsman to 3.61 for general corpsman medical skills.

The survey included a number of other questions assessing the participants' satisfaction with the training (Table III). The majority of the sample either strongly agreed (57.2%) or agreed (23.5%) with the item, "I really enjoyed the training and would like to participate in additional trainings like it." Most respondents also strongly agreed (35.4%) or agreed (29.6%) that "The training was a good test of my overall corpsman skills set."

Most participants felt that the training had given them a sense of accomplishment: the majority gave ratings of "extremely," "very," or "moderately" for this item. Similarly, most of the participants indicated that the training had strengthened their confidence in their ability to provide medical care (Table III).

Participants were also asked to rate how satisfied they were with their own performance and with their squad's performance during the training (Table III). Overall, participants were satisfied with their own performance; most participants indicated that they were "extremely" or "very" satisfied with their own performance (63.5%). Participants' satisfaction with their squad's performance was somewhat lower than their satisfaction with their own performance. Less than half of the sample (44.7%) was "extremely" or "very" satisfied with their squad's performance.

The survey included the following open-ended questions: "What did you like the most about the training?" and "What suggestions do you have for improving the training?" Representative responses to these questions are shown in Table IV. In response to the question that asked what participants liked the most about the training, the most common theme involved the use of live actors. A representative comment was, "My

**TABLE III.** Participants' Satisfaction With the Training

| Survey Item | Disagree[a] | Neutral | Agree | Strongly Agree | Mean Rating |
|---|---|---|---|---|---|
| I really enjoyed the training and would like to participate in additional trainings like it. | 8.2% | 11.2% | 23.5% | 57.2% | 4.27 |
| The training was a good test of my overall corpsman skills set. | 15.6% | 19.4% | 29.6% | 35.4% | 3.79 |
| | Not At All/Somewhat[b] | Moderately | Very | Extremely | Mean Rating |
| The training has given me a sense of accomplishment. | 19.6% | 25.6% | 35.7% | 19.1% | 3.46 |
| Did the training strengthen your confidence about your ability to provide medical care? | 17.9% | 21.7% | 37.5% | 22.8% | 3.57 |
| How satisfied were you with your performance? | 8.3% | 28.2% | 42.7% | 20.8% | 3.72 |
| How satisfied were you with your squad's performance? | 23.6% | 31.7% | 31.3% | 13.4% | 3.28 |

[a]Responses of "strongly disagree" and "disagree" were combined. [b]Responses of "not at all" and "somewhat" were combined.

**TABLE IV.** Responses to Open Ended Survey Items (Representative Comments)

| What Participants Liked Most About the Training |
|---|
| The use of actors added depth to the training unlike any I've received in the military |
| My favorite part was having live actors because it made everything more realistic |
| Actors created a believable and realistic setting |
| Live actors who provided a more realistic feel to how things really happen in the field |
| The live actors really put into perspective how important all of this is |
| Actually getting to practice what we learned in a live scenario |
| The chaotic environment and complete disarray really provided a good challenge |
| Being able to apply learned skills |
| The overall culmination of the MOUT training was a great eye opener, and I was able to gauge myself as a Fleet Marine Force corpsman for the first time |
| The fact that the patient would respond to your treatments and you could see your interventions work |
| It was the most realistic training I have gone through to date |
| The sense of realism, stress, urgency, and training all played a part in helping my confidence and abilities to perform |
| The realistic scenarios |
| The effects and environment make it all feel realistic |
| **Participants' Suggestions for Improving the Training** |
| Give more scenarios and more time at MOUT |
| Do the training multiple times, so that everyone can be the corpsman |
| Lengthen the time so that more people get the chance to go through every role |
| Getting more of the cut suits so we get more "life like" training |
| Have more special effects for a more realistic setting |
| More distractions, gun fire, explosions |
| More emphasis on communication and movement |
| More exposure to the cut suits and scenarios we as a whole greatly benefited from that |
| Simply more training like this it would be nice to have time to become more proficient at it |
| More patients and a bigger town |
| Add more injuries, casualties, distracters |
| Just having more of the MOUT training |
| Make sure everyone knows their role |

favorite part was having live actors because it made everything realistic." Two other common themes in response to this question were that participants liked the overall sense of realism and they liked having the chance to apply the medical skills they had learned. Additionally, some responses to this question were broad in nature (e.g., "The use of actors added depth to the training unlike any I've received in the military") or touched on the fact that the training made them realize how important their work as corpsmen would ultimately be ("The live actors really put into perspective how important all of this is.").

The most common theme in response to the question "What suggestions do you have for improving the training?" was that the training should be longer, with more scenarios. Another common suggestion was that everyone should be given the opportunity to play the role of corpsman or to provide medical care during the training. (Because of the large number of students that ran through each scenario, every student did not get the chance to play the role of corpsman or medical provider, but they still played other roles, such as litter bearer or fire team leader.) Other frequent suggestions were that there should be more special effects (e.g., explosions and gunfire) to add greater realism to the training, that the training town should be made larger, and that more role players/actors should be utilized in the training. In general, the majority of the suggestions for improving the training revealed that participants thought that the training should be expanded, lengthened, or enhanced in some way.

## DISCUSSION

The Navy has only recently begun to utilize highly realistic training for military medical personnel such as corpsmen. To our knowledge, this is the first project to implement and evaluate this type of training for Navy corpsmen. Data collection for this project is not yet complete; the data presented in this article are preliminary results regarding the participants' satisfaction with the highly realistic training they received as part of their final course exercise.

Corpsmen students attending FMTB West expressed high levels of satisfaction with highly realistic training overall and with specific elements of the training. Most of the study participants expressed the belief that the training had increased their overall confidence about being successful corpsmen and that the training had strengthened their confidence in their ability to provide medical care. Corpsmen students reported that participating in the training had benefited their general corpsman medical skills, as well as their ability to perform in operational environments and to provide medical care under pressure.

When asked what they liked the most about the highly realistic training, the most common response was the use of

role players/live actors. When asked for suggestions about improving the training, the most common theme in the responses was that the training should be longer, with more scenarios, and that more participants should be given the chance to play the role of corpsman during the training.

The next steps of the project are to continue to implement the training and to continue the administration of pretraining and post-training surveys to evaluate the training. Once data collection is complete, analyses will be conducted to test the other hypotheses of the project. In addition to hypothesizing that the participants will express a high level of satisfaction with the training, we hypothesize that the training will increase the corpsmen's level of self-efficacy as well as their sense of readiness to work in operational environments. Future work will also include longitudinal follow-up of corpsmen who received the training to determine the degree to which highly realistic training had an impact on participants' confidence, readiness, and ability to provide clinical care. In addition, an interview study on the perceived effectiveness of highly realistic training and live tissue for corpsmen is currently being conducted.

The cost of highly realistic training is not insignificant and would need to be factored into plans to integrate this training into any curriculum. For the training implemented in the current project, the cost was approximately $51.00 per student, with each student participating in two scenarios. This was reasonable because of the large number of students (about 250) who were trained during the entire exercise. The cost for a smaller cohort of students, or for a training program that utilized a greater number of scenarios, may be substantially higher.

Highly realistic training appears to be a very useful and effective way to train and prepare Navy corpsmen. The use of effective simulation training methods, such as highly realistic training, may ultimately result in corpsmen who are better able to deliver high-quality medical care in a variety of treatment settings (e.g., combat zones). Moreover, the use of highly realistic training and other effective simulation technologies for medical training is consistent with the goal of the Department of Defense to reduce the use of medical training that relies on live animals.[6] Live tissue training involves the use of animals, typically pigs, which are anesthetized and used in training for the practice of specific medical skills. However, this type of training has become highly controversial in recent years, mainly because of ethical issues about the proper use and care of animals. Although live tissue training has been an important component of corpsmen training, military leadership has indicated an interest in identifying viable alternative training methods that would allow live tissue training to be phased out.

These preliminary results provide some evidence that highly realistic training improves corpsmen's confidence in their capabilities to be successful corpsmen, particularly with respect to their abilities to perform in an operational environment and to provide medical care under pressure. Similar training may prove to be especially useful for other military medical care providers (e.g., physicians and nurses) who train for deployment in operational settings. Clearly, any training that improves the ability of medical personnel to provide quality care to their patients is of great value. Because each provider is likely to deliver care to hundreds of service member patients, improving the training and preparation of military medical providers is a very cost-effective way to improve the health care services provided to our armed forces.

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**14. ABSTRACT**

Highly realistic, immersive training has recently been developed for Navy corpsmen. This new training involves scenarios that are carefully designed to simulate operational situations through the use of realistic sights, sounds, smells, and distractions to create a heightened sense of situational awareness and pressure. The primary objective of this study was to assess corpsmen participants' satisfaction with highly realistic training. The study sample consisted of 434 male Navy service members attending Field Medical Training Battalion–West, Camp Pendleton, California. Corpsmen participants completed surveys after receiving the training. They were asked to rate the training and expressed high levels of satisfaction with the training overall, as well as with specific elements of the training. The element of the training that the corpsmen rated the highest was the use of live actors. The majority of the participants reported that the training had increased their overall confidence in being successful corpsmen, and had strengthened their confidence in their ability to provide care under pressure. Additional research should extend this training to other military medical provider populations.

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